# Igiugig, Alaska: Case study in solving the global problem of costly and inadequate access to electricity in remote regions

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ORPC OCEAN RENEWABLE POWER COMPANY

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# Remote “Islanded” Communities Around the World

- 770 million people live in isolated communities dependent on diesel generation for electricity
- Diesel generation is expensive and has inherent price volatility and environmental risk.
- Indigenous people inhabit many of these communities.
- Most are near river or tidal hydrokinetic resources.
- Nearly all Arctic region communities are remote and have “islanded” power grids.



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# Challenge #1 - Can device be installed with only locally available vessels?



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# Challenge #2 - Can we successfully generate power from the river, send it to shore and connect into Igiugig's grid to displace diesel fuel use?



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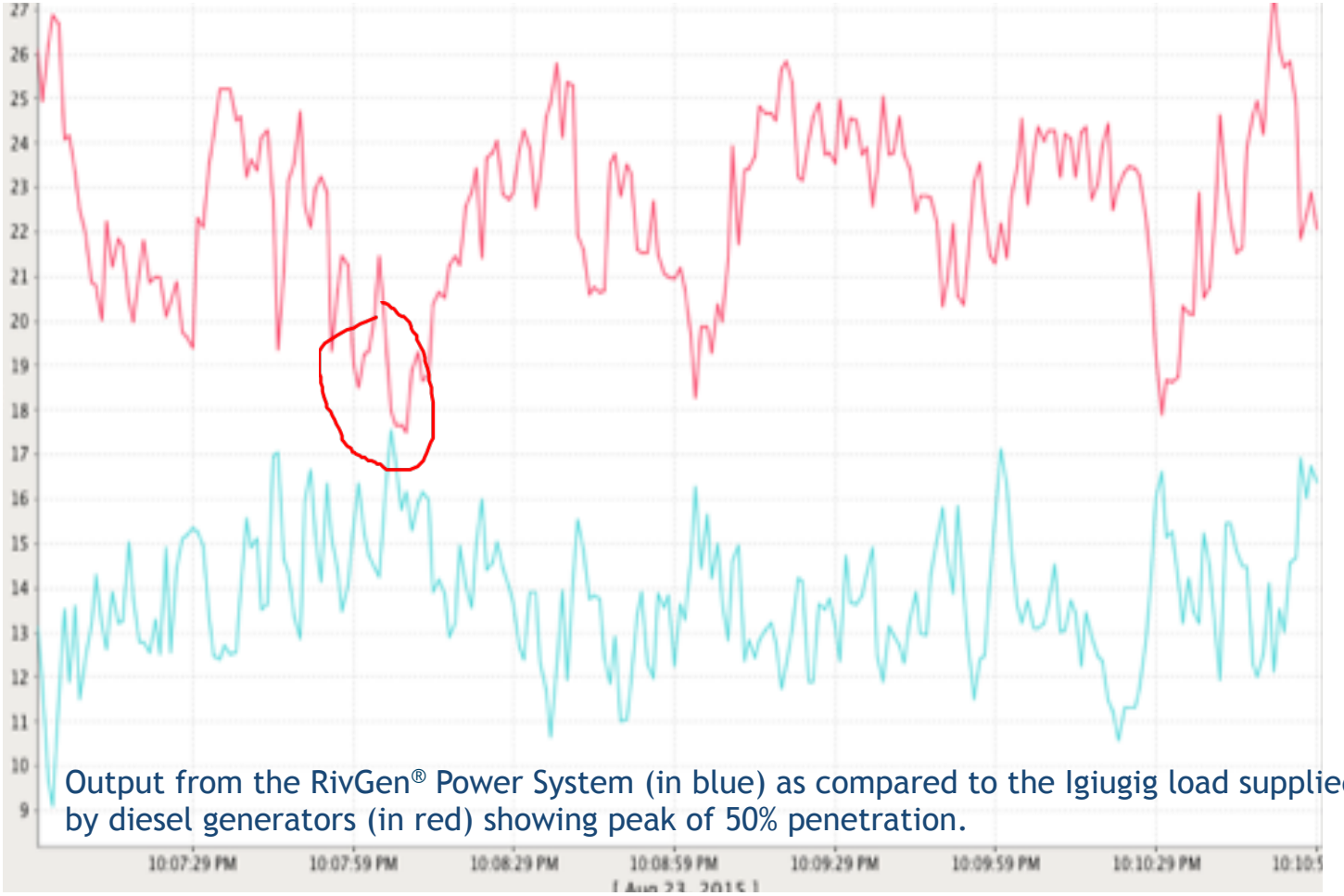
# Power delivered to grid!

*Power integration validated through on shore power electronics system*




Output from the RivGen® Power System (in blue) as compared to the Igiugig load supplied by diesel generators (in red) showing peak of 50% penetration.

- Output varied from 10-19 kW depending on control algorithm exercised.
- Supplied roughly 1/3 of Igiugig village load during optimal operation with peak of 50% penetration
- Several controls schemes tested to maximize efficiency



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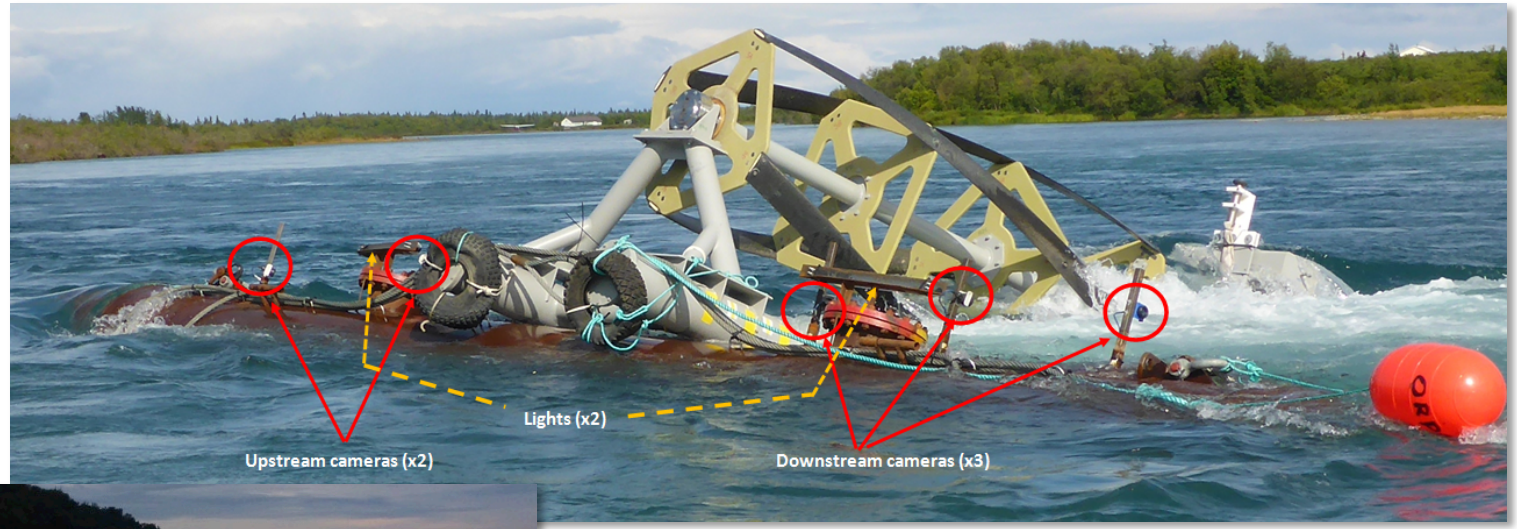
# Challenge #3 - Is the marine environment adversely affected by the presence of the device?



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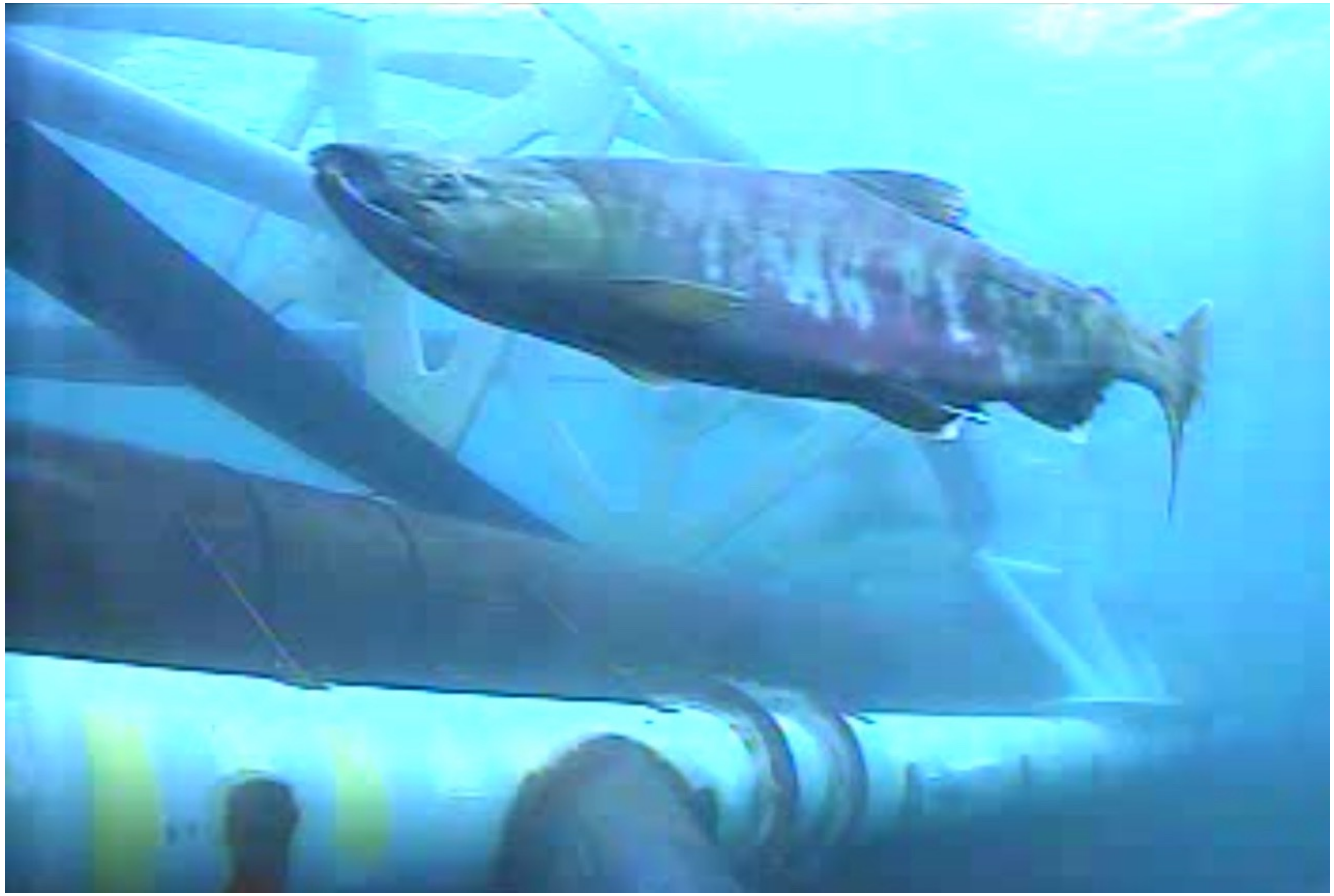
# No adverse impact on marine environment!



- 1.2 million sockeye salmon
- 400 hours of video reviewed



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## Remote communities need renewable energy solutions which they can install and maintain themselves using local people, vessels and infrastructure.


***The outcome will lead to their strengthened viability and sustainability.***



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# *Thank you!*

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